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Important Things for You to Know About Cancer

his booklet will give you some important information about *cancer*.* It describes some of the warning signs of cancer and stresses the importance of early detection. It also explains how this disease is diagnosed and treated and has information to help you deal with cancer if it affects you or someone you know. The booklet also lists some possible causes of cancer and suggests ways to avoid many of them.

This booklet cannot answer every question you may have about cancer. It cannot take the place of talks with doctors, nurses, and other members of the health care team. We hope our information will help with those talks.

Researchers continue to look for better ways to diagnose and treat cancer, and our knowledge is growing.



> What Is Cancer?

Cancer* is a name for a group of more than 100 different diseases. Cancer occurs when cells become abnormal and keep dividing and forming more cells without control or order.

All organs of the body are made up of cells. Normally, cells divide to produce more cells only when the body needs them. This orderly process helps keep us healthy.

If cells keep dividing when new cells are not needed, a mass of *tissue* forms. This mass of extra tissue, called a growth or *tumor*, can be *benign or malignant*.

- Benign tumors are not cancer. They can usually be removed and, in most cases, they do not come back. Most important, cells from benign tumors do not spread to other parts of the body. Benign tumors are rarely a threat to life.
- Malignant tumors are cancer. Cancer cells can invade and damage nearby tissues and organs. Also, cancer cells can break away from a malignant tumor and enter the bloodstream or the *lymphatic system*. This is how cancer spreads from the original (primary) tumor to form new tumors in other parts of the body. The spread of cancer is called *metastasis*.

*Words in italics are defined in the glossary on page 33.

Most cancers are named for the type of cell or the organ in which they begin. When cancer spreads, the new tumor has the same kind of abnormal cells and the same name as the primary tumor. For example, if lung cancer spreads to the liver, the cancer cells in the liver are lung cancer cells. The disease is called metastatic lung cancer (not liver cancer).



🐎 Early Detection

In many cases, the sooner cancer is diagnosed and treated, the better a person's chance for a full recovery. If you develop cancer, you can improve the chance that it will be detected early if you have regular medical checkups and do certain self-exams. Often, a doctor can find early cancer during a physical exam or with routine tests-even if a person has no symptoms. Some important medical exams, tests, and selfexams are discussed on the next pages. The doctor may suggest other exams for people who are at increased risk for cancer.

Ask your doctor about your cancer risk, about problems to watch for, and about a schedule of regular checkups. The doctor's advice will be based on your age, medical history, and other risk factors. The doctor also can help you learn about self-exams. Many local health departments have information about cancer screening or early detection programs.

Exams for Both Men and Women

Skin. The doctor should examine your skin during regular checkups for signs of skin cancer. You should also check regularly for new growths; sores that do not heal; changes in the size, shape, or color of any moles; or any other changes on the skin. Warning signs like these should be reported to the doctor right away.

Colon and Rectum. Beginning at age 50, you should have a *yearly fecal occult blood test*. This test is a check for hidden (occult) blood in the stool. A small amount of stool is placed on a plastic slide or on special paper. It may be tested in the doctor's office or sent to a lab. This test is done because cancer of the colon and rectum may cause bleeding. However, noncancerous conditions may also cause bleeding, so having blood in the stool does not necessarily mean a person has cancer. If blood is found, the doctor orders more tests to help make a diagnosis.

To check for cancer of the rectum, the doctor inserts a gloved finger into the rectum and feels for any bumps or abnormal areas. A digital rectal exam should be done during regular checkups.

Every 3 to 5 years after age 50, you should have *a sigmoidoscopy*. In this exam, the doctor uses a thin, flexible tube with a light to look inside the rectum and colon for abnormal areas.

Mouth. Your doctor and dentist should examine your mouth at regular visits. Also, by looking in a mirror, you can check inside your mouth for changes in the color of the lips, gums, tongue, or inner cheeks, and for scabs, cracks, sores, white patches, swelling, or bleeding. It is often possible to see or feel changes in the mouth that might be cancer or a condition that might lead to cancer. Any symptoms in your mouth should be checked by a doctor or dentist. Oral exams are especially important for people who abuse alcohol or tobacco products and for anyone over age 50.

Exams for Men

Prostate. Men over age 40 should have a yearly digital rectal exam to check the prostate gland for hard or lumpy areas. The doctor feels the prostate through the wall of the rectum.

Testicles. Testicular cancer occurs most often between ages 15 and 34. Most of these cancers are found by men themselves, often by doing a testicular self-exam. If you find a lump or notice another change, such as heaviness, swelling, unusual tenderness, or pain, you should see your doctor. Also, the doctor should examine the testicles as part of regular medical checkups.

Exams for Women

Breast. When breast cancer is found early, a woman has more treatment choices and a good chance of complete recovery. So it is important that breast cancer be detected as early as possible. The National Cancer Institute encourages women to take an active part in early detection. They should talk to their doctor about this disease, the symptoms to watch for, and an appropriate schedule of checkups. Women should ask their doctor about:



- *Mammograms* (x-rays of the breast),
- Breast exams by a doctor or nurse, and
- Breast self-examination (BSE).

A mammogram can often show tumors or changes in the breast before they can be felt or cause symptoms. However, we know mammograms cannot find every abnormal area in the breast. This is especially true in the breasts of young women. Another important step in early detection is for women to have their breasts examined regularly by a doctor or a nurse.

Between visits to the doctor, women should examine their breasts every month. By doing breast self-exams (BSE), women learn what looks and feels normal for their breasts, and they are more likely to find a change. Any changes should be reported to the doctor. Most breast lumps are not cancer, but only a doctor can make a diagnosis.

Cervix. Regular pelvic exams and Pap tests are important to detect cancer of the cervix at an early stage. In a pelvic exam, the doctor feels the uterus, vagina, ovaries, fallopian tubes, bladder, and rectum for any change in size or shape.

For the Pap test, a sample of cells is collected from the upper vagina and cervix with a small brush or a flat wooden stick. The sample is placed on a glass slide and checked under a microscope for cancer or other abnormal cells.

Women should start having a Pap test every year after they turn 18 or become sexually active. If the results are normal for 3 or more years in a row, a woman may have this test less often, based on her doctor's advice.



Symptoms of Cancer

You should see your doctor for regular checkups and not wait for problems to occur. But you should also know that the following symptoms may be associated with cancer:

- Changes in bowel or bladder habits, a sore that does not heal, unusual bleeding or discharge,
- Thickening or lump in the breast or any other part of the body,
- Indigestion or difficulty swallowing, obvious change in a wart or mole, or
- Nagging cough or hoarseness.

These symptoms are not always a sign of cancer. They can also be caused by less serious conditions. Only a doctor can make a diagnosis. It is important to see a doctor if you have any of these symptoms. Don't wait to feel pain: Early cancer usually does not cause pain.



🐎 Diagnosis

If you have a sign or symptom that might mean cancer, the doctor will do a physical exam and ask about your medical history. In addition, the doctor usually orders various tests and exams. These may include imaging procedures, which produce pictures of areas inside the body; endoscopy, which allows the doctor to look directly inside certain organs; and laboratory tests. In most cases, the doctor also orders a biopsy, a procedure in which a sample of tissue is removed. A pathologist examines the tissue under a microscope to check for cancer cells.

Imaging

Images of areas inside the body help the doctor tell whether a tumor is present. These images can be made in several ways. In many cases, the doctor uses a special dye so that certain organs show up better on film. The dye may be swallowed or put into the body through a needle or a tube.

X-rays are the most common way doctors make pictures of the inside of the body. In a special kind of x-ray imaging, a *CT or CAT scan* uses a computer linked to an x-ray machine to make a series of detailed pictures.

In *radionuclide scanning*, the patient swallows or is given an injection of a mildly *radioactive* substance. A machine (scanner) measures radioactivity levels in certain organs and prints a picture on paper or film. By looking at the amount of radioactivity in the organs, the doctor can find abnormal areas.

Ultrasonography is another procedure for viewing the inside of the body. High-frequency sound waves that cannot be heard by humans enter the body and bounce back. Their echoes produce a picture called a sonogram. These pictures are shown on a monitor like a TV screen and can be printed on paper.

In *MRI*, a powerful magnet linked to a computer is used to make detailed pictures of areas in the body. These pictures are viewed on a monitor and can also be printed.

Endoscopy

Endoscopy allows the doctor to look into the body through a thin, lighted tube called an endoscope. The exam is named for the organ involved (for example, colonoscopy to look inside the colon). During the exam, the doctor may collect tissue or cells for closer examination.



Laboratory Tests

Although no single test can be used to diagnose cancer, laboratory tests such as blood and urine tests give the doctor important information. If cancer is present, lab work may show the effects of the disease on the body. In some cases, special tests are used to measure the amount of certain substances in the blood, urine, other body fluids, or tumor tissue. The levels of these substances may become abnormal when certain kinds of cancer are present.

Biopsy

The physical exam, imaging, endoscopy, and lab tests can show that something abnormal is present, but a biopsy is the only sure way to know whether the problem is cancer. In a biopsy, the doctor removes a sample of tissue from the abnormal area or may remove the whole tumor. A pathologist examines the tissue under a microscope. If cancer is present, the pathologist can usually tell what kind of cancer it is and may be able to judge whether the cells are likely to grow slowly or quickly.

Staging

When cancer is found, the patient's doctor needs to know the *stage*, or extent, of the disease to plan the best treatment. The doctor may order various tests and exams to find out whether the cancer has spread and, if so, what parts of the body are affected. In some cases, *lymph nodes*



near the tumor are removed and checked for cancer cells. If cancer cells are found in the lymph nodes, it may mean that the cancer has spread to other organs.



Treatment

Cancer is treated with surgery, radiation therapy, chemotherapy, hormone therapy, or biological therapy. Patients with cancer are often treated by a team of specialists, which may include a medical oncologist (specialist in cancer treatment), a surgeon, a radiation oncologist (specialist in radiation therapy), and others. The doctors may decide to use one treatment method or a combination of methods. The choice of treatment depends on the type and location of the cancer, the stage of the disease, the patient's age and general health, and other factors.

Some cancer patients take part in a clinical trial (research study) using new treatment methods. Such studies are designed to improve cancer treatment.



Getting a Second Opinion

Before starting treatment, the patient may want another doctor to review the diagnosis and treatment plan. Some insurance companies require a second opinion; others may pay for a second opinion if the patient requests it. There are a number of ways to find specialists to consult for a second opinion:



- The patient's doctor may suggest a specialist for a second opinion.
- The Cancer Information Service, at 1-800-4-CANCER, can tell callers about treatment facilities, including cancer centers and other programs in their area supported by the National Cancer Institute.
- Patients can get the names of doctors from their local medical society, a nearby hospital, or a medical school.

Preparing for Treatment

Many people with cancer want to learn all they can about their disease and their treatment choices so they can take an active part in decisions about their medical care. Often, it helps to make a list of questions to ask the doctor. Patients may take notes or, with the doctor's consent, tape record the discussion. Some patients also find it helps to have a family member or friend with them when they talk with the doctor — to take part in the discussion, to take notes, or just to listen.

Here are some questions a patient may want to ask the doctor:

- What is my diagnosis?
- What is the stage of the disease?
- What are my treatment choices? Which do you recommend for me? Why?
- What are the chances the treatment will be successful?
- Would a clinical trial be appropriate for me?
- What are the risks and possible side effects of each treatment?
- How long will treatment last?
- Will I have to change my normal activities?
- What is the treatment likely to cost?

When a person is diagnosed with cancer, shock and stress are natural reactions. These feelings may make it difficult to think of every question to ask the doctor. Patients may find it hard to remember everything the doctor says. They should not feel they need to ask all their questions or remember all the answers at one time. They will have other chances for the doctor to explain things that are not clear and to ask for more information.

Methods of Treatment

Surgery. Surgery is local treatment to remove the tumor. Tissue around the tumor and nearby lymph nodes may also be removed during the operation.

Radiation Therapy. In radiation therapy (also called radiotherapy), high-energy rays are used to damage cancer cells and stop them from growing and dividing. Like surgery, radiation therapy is a local treatment; it can affect cancer cells only in the treated area. Radiation may come from a machine (external radiation). It also may come from an implant (a small container of radioactive material) placed directly into or near the tumor (internal radiation). Some patients get both kinds of radiation therapy.

External radiation therapy is usually given on an outpatient basis in a hospital or clinic 5 days a week for several weeks. Patients are not radioactive during or after the treatment.

For internal radiation therapy, the patient stays in the hospital for a few days. The implant may be temporary or permanent. Because the level of radiation is highest during the hospital stay, patients may not be able to have visitors or may have visitors only for a short time. Once an implant is removed, there is no radioactivity in the body. The amount of radiation in a permanent implant goes down to a safe level before the patient leaves the hospital.

Chemotherapy. Treatment with drugs to kill cancer cells is called chemotherapy. Most anticancer drugs are injected into a vein (IV) or a muscle; some are given by mouth. Chemotherapy is *systemic treatment*, meaning that the drugs flow through the bloodstream to nearly every part of the body.

Often, patients who need many doses of IV chemotherapy receive the drugs through a *catheter* (a thin flexible tube). One end of the catheter is placed in a large vein in the chest. The other end is outside the body or attached to a small device just under the skin. Anticancer drugs are given through the catheter. This can make chemotherapy more comfortable for the patient. Patients and their families

are shown how to care for the catheter and keep it clean. For some types of cancer, doctors are studying whether it helps to put anticancer drugs directly into the affected area. Chemotherapy is generally given in cycles: A treatment period is followed by a recovery period, then another treatment period, and so on. Usually a patient has chemotherapy as an outpatientat the hospital, at the doctor's office, or at home. However, depending on which drugs are given and the patient's general

health, the patient may need to stay in the hospital for a short time.

Hormone Therapy. Some types of cancer, including most breast and prostate cancers, depend on hormones to grow. For this reason, doctors may recommend therapy that prevents cancer cells from getting or using the hormones they need. Sometimes, the patient has surgery to remove organs (such as the ovaries or testicles) that make the hormones; in other cases, the doctor uses drugs to stop hormone production or change the way hormones work. Like chemotherapy, hormone therapy is a systemic treatment; it affects cells throughout the body.

Biological Therapy. Biological therapy (also called *immunotherapy*) is a form of treatment that uses the body's natural ability (immune system) to fight infection and disease or to protect the body from some of the side effects of treatment. Monoclonal antibodies, interferon, interleukin-2 (IL-2), and several types of colony stimulating factors (CSF, GM-CSF, G-CSF) are forms of biological therapy.



🐎 Side Effects of Cancer Treatment

It is hard to limit the effects of treatment so that only cancer cells are removed or destroyed. Because treatment also damages healthy cells and tissues, it often causes unpleasant side effects.

The side effects of cancer treatment vary. They depend mainly on the type and extent of the treatment. Also, each person reacts differently. Doctors try to plan the patient's therapy to

keep side effects to a minimum, and they can help with any problems that occur.

Surgery. The side effects of surgery depend on the location of the tumor, the type of operation, the patient's general health, and other factors. Although patients are often uncomfortable during the first few days after surgery, this pain can be controlled with medicine. Patients should feel free to discuss pain relief with the doctor or nurse. It is also common for patients to feel tired or weak for a while. The length of time it takes to recover from an operation varies for each patient.



Radiation Therapy. With radiation therapy, the side effects depend on the treatment dose and the part of the body that is treated. The most common side effects are tiredness, skin reactions (such as a rash or redness) in the treated area, and loss of appetite. Radiation therapy also may cause a decrease in the number of *white blood cells*, cells that help protect the body against infection.

Although the side effects of radiation therapy can be unpleasant, the doctor can usually treat or control them. It also helps to know that, in most cases, they are not permanent.

Chemotherapy. The side effects of chemotherapy depend mainly on the drugs and the doses the patient receives. Generally, anticancer drugs affect cells that divide rapidly. These include blood cells, which fight infection, help the blood to clot, or carry oxygen to all parts of the body. When blood cells are affected by

anticancer drugs, patients are more likely to get infections, may bruise or bleed easily, and may have less energy. Cells that line the digestive tract also divide rapidly. As a result of chemotherapy, patients may have side effects, such as loss of appetite, nausea and vomiting, hair loss, or mouth sores. For some patients, the doctor may prescribe medicine to help with side effects, especially with nausea and vomiting. Usually, these side effects gradually go away during the recovery period or after treatment stops.

Hair loss, another side effect of chemotherapy, is a major concern for many patients. Some chemotherapy drugs only cause the hair to thin out, while others may result in the loss of all body hair. Patients may feel better if they decide how to handle hair loss before starting treatment.

In some men and women, chemotherapy drugs cause changes that may result in a loss of fertility (the ability to have children). Loss of fertility may be temporary or permanent depending on the drugs used and the patient's age. For men, sperm banking before treatment may be a choice. Women's menstrual periods may stop, and they may have hot flashes and vaginal dryness. Periods are more likely to return in young women.



In some cases, bone marrow transplantation and peripheral stem cell support are used to replace tissue that forms blood cells when that tissue has been destroyed by the effects of chemotherapy or radiation therapy.

Hormone Therapy. Hormone therapy can cause a number of side effects. Patients may have nausea and vomiting, swelling or weight gain, and, in some cases, hot flashes. In women, hormone therapy also may cause interrupted menstrual periods, vaginal dryness, and, sometimes, loss of fertility. Hormone therapy in men may cause *impotence*, loss of sexual desire, or loss of fertility. These changes may be temporary, long lasting, or permanent.

Biological Therapy. The side effects of biological therapy depend on the type of treatment. Often, these treatments cause flu-like symptoms such as chills, fever, muscle aches, weakness, loss of appetite, nausea, vomiting, and diarrhea. Some patients get a rash, and some bleed or bruise easily. In addition, interleukin therapy can cause swelling. Depending on how severe these problems are, patients may need to stay in the hospital during treatment. These side effects are usually short-term; they gradually go away after treatment stops.

Doctors and nurses can explain the side effects of cancer treatment and help with any problems that occur. The National Cancer Institute booklets *Radiation Therapy and You* and *Chemotherapy and You* also have helpful information about cancer treatment and coping with side effects. You may obtain copies by calling the Cancer Information Service at 1-800-4-CANCER (1-800-422-6237).



Nutrition for Cancer Patients

Some patients lose their appetite and find it hard to eat well. In addition, the common side effects of treatment, such as nausea, vomiting, or mouth sores, can make it difficult to eat. For some patients, foods tasted different. Also, people may not feel like eating when they are uncomfortable or tired.

Eating well means getting enough calories and protein to help prevent weight loss and regain strength. Patients who eat well during cancer treatment often feel better and have more energy. In addition, they may be better able to handle the side effects of treatment.

Doctors, nurses, and dietitians can offer advice for healthy eating during cancer treatment. Patients and their families also may want to read the National Cancer Institute booklet Eating Hints: Recipes and Tips For Better Nutrition During Cancer Treatment, which contains many useful suggestions.



Clinical Trials

When laboratory research shows that a new treatment method has promise, cancer patients can receive the treatment in carefully controlled trials. These trials are designed to find out whether the new approach is both safe and effective and to answer scientific questions. Often, clinical trials compare a new treatment with a standard approach so that doctors can learn which is more effective.

Researchers also look for ways to reduce the side effects of treatment and improve the quality of patients' lives. Patients who take part in clinical trials make an important contribution to medical science. Patients take certain risks, but they also may have the first chance to benefit from improved treatment methods.

Clinical trials offer important options for many patients. Cancer patients who are interested in taking part in a clinical trial should talk with their doctor. They may want to read *What Are Clinical Trials All About?*, a booklet that explains treatment studies and outlines some of their possible benefits and risks.



One way to learn about clinical trials is through PDO, a computerized resource developed by the National Cancer Institute. PDO contains information about cancer treatment and about clinical trials in progress all over the country. The Cancer Information Service can provide PDO information to doctors, patients, and the public.



Support for Cancer Patients

Living with a serious disease is difficult. Cancer patients and those who care about them face many problems and challenges. Coping with these problems is often easier when people have helpful information and support services.

Cancer patients may worry about holding their job, caring for their family, or keeping up daily activities. Worries about tests, treatments, hospital stays, and medical bills are also common. Doctors, nurses, and other members of the health care team can answer questions about treatment, working, or daily activities. Meeting with a social worker, counselor, or member of the clergy also can be helpful to patients who want to talk about their feelings or discuss their concerns about the future or about personal relationships.

Friends and relatives, especially those who have had personal experience with cancer, can be very supportive. Also, it helps many patients to meet with others who are facing problems like theirs.

Cancer patients often get together in support groups, where they can share what they have learned about cancer and its treatment and about coping with the disease. It is important to keep in mind, however, that each patient is different. Treatments and ways of dealing with cancer that work for one person may not be right for another-even if both have the same kind of cancer. It is always a good idea to discuss the advice of friends and family members with the doctor.

Often, a social worker at the hospital or clinic can suggest groups that help with rehabilitation, emotional support, financial aid, transportation, or home care. The American Cancer Society has many services for patients and families. Local offices of the American Cancer Society are listed in the white pages of the telephone directory.

In addition, the public library has many books and articles on living with cancer. The Cancer Information Service also has information on local resources.





Nhat the Future Holds

Researchers are finding better ways to detect and treat cancer, and the chance of recovery keeps improving. Still, it is natural for patients to be concerned about their future.

Sometimes patients use statistics to try to figure

out their chance of being cured. It is important to remember, however, that statistics are averages based on large numbers of patients. They cannot be used to predict what will happen to a particular patient because no two patients are alike. The doctor who takes care of the patient is in the best position to discuss the chance of recovery (prognosis). Patients should feel free to ask the doctor about their prognosis, but they should keep in mind that not even the doctor knows exactly what will happen. Doctors often talk about surviving cancer, or they may use the term remission rather than cure. Even though many cancer patients are cured, doctors use these terms because the disease may recur.



Causes and Prevention of Cancer

The number of new cases of cancer in the United States is going up each year. People of all ages get cancer, but nearly all types are more common in middle-aged and elderly people than in young people. Skin cancer is the most common type of cancer for both men and women. The next most common type among men is prostate cancer; among women, it is breast cancer. Lung cancer, however, is the leading cause of death from cancer for both men and women in the United States. Brain cancer and leukemia are the most common cancers in children and young adults. The more we can learn about what causes cancer, the more likely we are to find ways to prevent it. Scientists study patterns of cancer in the population to look for factors that affect the risk of developing this disease. In the laboratory, they explore possible causes of cancer and

try to determine what actually happens when normal cells become cancerous.

Our current understanding of the causes of cancer is incomplete, but it is clear that cancer is not caused by an injury, such as a bump or bruise. And although being infected with certain viruses may increase the risk of some types of cancer, cancer is not contagious; no one can "catch" cancer from another person.

Cancer develops gradually as a result of a complex mix of factors related to environment, lifestyle, and heredity. Scientists have identified many risk factors that increase the chance of getting cancer. They estimate that about 80 percent of all cancers are related to the abusive use of tobacco products, to what we eat and drink, or, to a lesser extent, to exposure to radiation or cancer-causing agents (carcinogens) in the environment and the workplace. Some people are more sensitive than others to factors that can cause cancer.

Many risk factors can be avoided. Others, such as inherited risk factors, are unavoidable. It is

helpful to be aware of them, but it is also important to keep in mind that not everyone with a particular risk factor for cancer actually gets the disease; in fact, most do not. People at risk can help protect themselves by avoiding risk factors where possible and by getting regular checkups so



that, if cancer develops, it is likely to be found early.

These are some of the factors that are known to increase the risk of cancer:

Tobacco. Tobacco was never meant to be abused. The Great Spirit put it here for us to use in sacred ways. Tobacco, when abused, causes cancer. In fact, abusively smoking tobacco, using "smokeless" tobacco in large quantities, and being regularly exposed to environmental tobacco smoke are responsible for one-third of all cancer deaths each year. Abusive tobacco use is the most preventable cause of death.

Abusive smoking accounts for more than 85 percent of all lung cancer deaths. If you use tobacco in other than sacred ways, your risk of getting lung cancer is affected by the number and type of cigarettes you smoke and how long you have been abusing tobacco. Overall, for those who smoke one pack of cigarettes a day, the chance of getting lung cancer is about 10 times greater than for those who do not smoke cigarettes regularly. Those who smoke cigarettes regularly are also more likely than those who use it in the sacred or ceremonial way to develop several other types of cancer (such as oral cancer and cancers of the larynx, esophagus, pancreas, bladder, kidney, and cervix). If you have smoked regularly, and you quit, the risk of cancer begins to decrease right away. And the risk continues to decline gradually each year.

The use of smokeless tobacco (chewing tobacco and snuff) causes cancer of the mouth and throat. Precancerous conditions, or tissue changes that may lead to cancer, begin to go away after a person stops using smokeless tobacco.

Exposure to environmental tobacco smoke, also called involuntary smoking, increases the risk of lung cancer for those who do not smoke. The risk goes up 30 percent or more for a nonsmoking spouse of a person who smokes abusively. Involuntary smoking causes about 3,000 lung cancer deaths each year.

If you use tobacco other than in the sacred way, and would like to stop, you can get information from the Cancer Information Service by calling 1-800-4-CANCER.

Diet. Your choice of foods may affect your chance of developing cancer. Evidence points to a link between a high-fat diet and certain cancers, such as cancer of the breast, colon, uterus, and prostate. Being seriously overweight appears to be linked to increased rates of cancer of the prostate, pancreas, uterus, colon, and ovary, and to breast cancer in older women. On the other hand, studies suggest that foods containing fiber and certain nutrients help protect us against some types of cancer.

You may be able to reduce your cancer risk by making some simple food choices. Try to have a varied, well-balanced diet that includes generous amounts of foods that are high in fiber, vitamins, and minerals. At the same time, try to cut down on fatty foods. You should eat five servings of fruits and vegetables each day, choose more whole-grain breads and cereals, and cut down on eggs, high-fat meat, high-fat dairy products (such as whole milk, butter, and most cheeses), salad dressings, margarine, and cooking oils.

Sunlight. *Ultraviolet radiation* from the sun and from other sources (such as sunlamps and



tanning booths) damages the skin and can cause skin cancer. Repeated exposure to ultraviolet radiation increases the risk of skin cancer, especially if you have fair skin or freckle easily. The sun's ultraviolet rays are strongest during the summer from about 10 a.m. to about 3 p.m. (daylight saving time). The risk is greatest at this time, when the sun is high overhead and shadows are short. As a rule, it is best to avoid the sun when your shadow is shorter than you are.

Protective clothing, such as a hat and long sleeves, can help block the sun's harmful rays. You can also use sunscreens to help protect yourself. Sunscreens are rated in strength according to their SPF (sun protection factor), which ranges from 2 to 30 and higher. Those rated 15 to 30 block most of the sun's harmful rays.

Alcohol. Drinking large amounts of alcohol increases the risk of cancer of the mouth, throat, esophagus, and larynx. (People who smoke cigarettes and drink alcohol have an especially high risk of getting these cancers.) Alcohol can damage the liver and increase the risk of liver cancer. Some studies suggest that drinking alcohol also increases the risk of breast cancer. So if you drink at all, do so in moderation-not more than one or two drinks a day.

Radiation. Exposure to large doses of radiation from medical x-rays can increase the risk of cancer. X-rays used for diagnosis expose you to very little radiation, and the benefits nearly always outweigh the risks.

However, repeated exposure can be harmful, so it is a good idea to talk with your doctor or



dentist about the need for each x-ray and ask about the use of shields to protect other parts of your body.

Before 1950, x-rays were used to treat noncancerous conditions (such as an enlarged thymus, enlarged tonsils and adenoids, ringworm of the scalp, and acne) in children and young adults. People who have received radiation to the head and neck have a higher-than-average risk of developing thyroid cancer years later. People with a history of such treatments should report it to their doctor and should have a careful exam of the neck every 1 or 2 years.

Chemicals and other substances in the work-place. Being exposed to substances such as metals, dust, chemicals, or pesticides at work can increase the risk of cancer. Asbestos, nickel, cadmium, uranium, radon, vinyl chloride, benzidene, and benzene are well known examples of carcinogens in the workplace. These may act alone or along with another carcinogen, such as cigarette smoke. For example, inhaling asbestos fibers increases the risk of lung diseases, including cancer, and the cancer risk is especially high for asbestos workers who smoke. It is important to follow work and safety rules to avoid contact with dangerous materials.

Hormone replacement therapy. Many women use *estrogen* therapy to control the hot flashes, vaginal dryness, and osteoporosis (thinning of the bones) that may occur during menopause. However, studies show that estrogen use increases the risk of cancer of the uterus. Other studies suggest an increased risk of breast cancer among women who have used high

doses of estrogen or have used estrogen for a long time. At the same time, taking estrogen may reduce the risk of heart disease and osteoporosis.

The risk of uterine cancer appears to be less when *progesterone* is used with estrogen than when estrogen is used alone. But some scientists are concerned that the addition of progesterone may also increase the risk of breast cancer.

Researchers are still studying and finding new information about the risks and benefits of taking replacement hormones. A woman considering hormone replacement therapy should discuss these issues with her doctor.

Diethylstilbestrol (DES). DES is a form of estrogen that doctors prescribed from the early 1940s until 1971 to try to prevent miscarriage. In some daughters of women who were given DES during pregnancy, the uterus, vagina, and cervix do not develop normally. DES-exposed daughters also have an increased chance of developing abnormal cells (dysplasia) in the cervix and vagina. In addition, a rare type of vaginal and cervical cancer has been found in a



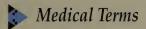
small number of DESexposed daughters. Women who took DES during pregnancy may have a slightly increased risk of developing breast cancer. DES-exposed mothers and daughters should tell their doctor about this exposure. DES daughters should have regular special pelvic exams by a

doctor familiar with conditions related to DES.

Exposure to DES before birth does not appear to increase the risk of cancer in DES-exposed sons; however, reproductive and urinary system problems may occur. These men should tell the doctor and should have regular medical checkups.

Close relatives with certain types of cancer. A small number of cancers (including *melanoma* and cancers of the breast, ovary, and colon) tend to occur more often in some families than in the rest of the population. It is not always clear whether a pattern of cancer in a family is due to heredity, factors in the family's environment, or chance. Still, if close relatives have been affected by cancer, it is important to let your doctor know this and then follow the doctor's advice about cancer prevention and checkups to detect problems early.





Benign (be-NINE): Not cancerous; does not invade nearby tissue or spread to other parts of the body.

Biological therapy (by-o-LOJ-i-kul): Treatment to stimulate or restore the ability of the immune system to fight infection and disease. Also called immunotherapy.

Biopsy (BY-op-see): The removal of a sample of tissue, which is then examined under a microscope to check for cancer cells. When only a sample of tissue is removed, the procedure is called incisional biopsy; when the whole tumor is removed, it is excisional biopsy. Removing tissue or fluid with a needle is called needle biopsy or needle aspiration.

Bone marrow transplantation: A procedure in which doctors replace marrow destroyed by treatment with high doses of anticancer drugs or radiation. The replacement marrow may be taken from the patient before treatment or may be donated by another person. When the patient's own marrow is used, the procedure is called autologous (aw-TOL-o-gus) bone marrow transplantation.

Cancer: A term for diseases in which abdominal cells divide without control. Cancer cells can invade nearby tissue and can spread through the bloodstream and lymphatic system to other parts of the body.

Carcinogen (kar-SIN-o-jin): A substance or agent that is known to cause cancer.

Catheter (KATH-e-ter): A thin plastic tube. When a catheter is placed in a vein, it provides a pathway for drugs, nutrients, or blood products. Blood samples also can be removed through the catheter.

Chemotherapy (kee-mo-THER-a-pee): Treatment with anticancer drugs.

Clinical trials: Research studies that involve patients.

Colony-stimulating factors: Substances that stimulate the production of blood cells. Treatment with colony stimulating factors (CSF) can help the blood-forming tissue recover from the effects of chemotherapy and radiation therapy. These include granulocyte colony stimulating factors (G-CSF) and granulocyte-macrophage colony-stimulating factors (GM-CSF).

CT or CAT scan: Detailed pictures of areas of the body created by a computer linked to an x-ray machine. Also called computed tomography scan or computed axial tomography scan.

Endoscopy (en-DOS-ko-pee): A procedure in which the doctor looks inside the body through a lighted tube called an endoscope.

Estrogen (ES-tro-jin): A female hormone.

Fecal occult blood test (FEE-kul o-KULT): A test to check for hidden blood in stool. (Fecal refers to stool. Occult means hidden.)

Gene therapy: Treatment that alters genes (the basic units of heredity found in all cells in the body). In early studies of gene therapy for cancer, researchers are trying to improve the body's natural ability to fight the disease or to make the tumor more sensitive to other kinds of therapy.



Hormone therapy: Treatment that prevents certain cancer cells from getting the hormones they need to grow.

Hormones: Chemicals produced by glands in the body. Hormones control the actions of certain cells or organs.

Imaging: Procedures that produce pictures of areas inside the body.

Immune system: The complex group of cells and organs that defends the body against infection and disease.

Immunotherapy (IM-yoo-no-THER-a-pee): *See Biological therapy*.

Impotence (IM-po-tens): Inability to have an erection.

Interferon (in-ter-FEER-on): A type of biological response modifier (a substance that can improve the body's natural response to disease). It slows the rate of growth and division of cancer cells, causing them to become sluggish and die.

Interleukin-2 (in-ter-LOO-kin): A type of biological response modifier (a substance that can improve the body's natural response to disease). It stimulates the growth of certain diseasefighting blood cells in the immune system. Also called IL-2.

Local treatment: Treatment that affects the tumor and the area close to it.

Lymph (limf): An almost colorless fluid that travels through the lymphatic system and carries cells that help fight infection and disease.

Lymph nodes: Small, bean-shaped organs located along the channels of the lymphatic



system. Bacteria or cancer cells that enter the lymphatic system may be found in the nodes. Also called lymph glands.

Lymphatic system (lim-FAT-ik): The tissues and organs, including the bone marrow, spleen, thymus, and lymph nodes, that produce and store cells that fight infection and disease. This system also has channels that carry *lymph*.

Malignant (ma-LIG-nant): Cancerous.

Mammogram (MAM-o-gram): An x-ray of th breast.

Melanoma: Cancer of the cells that produce pigment in the skin. Melanoma usually begins in a mole.

Metastasis (meh-TAS-ta-sis): The spread of cancer from one part of the body to another. Cells in the metastatic (secondary) tumor are like those in the original (primary) tumor.

Monoclonal antibodies: Substances that can locate and bind to cancer cells wherever they are in the body. They can be used alone, or they can be used to deliver drugs, toxins, or radioactive material directly to the tumor cells.

MRI: A procedure using a magnet linked to a computer to create pictures of areas inside the body. Also called magnetic resonance imaging.

Oncologist (on-KOL-o-jist): A doctor who specializes in treating cancer.

Pap test: Microscopic examination of cells collected from the cervix. It is used to detect changes that may be cancer or may lead to cancer, and it can show noncancerous conditions, such as infection or inflammation. Also called Pap smear.



Pathologist (path-OL-o-jist): A doctor who identifies diseases by studying cells and tissues under a microscope.

Pelvic: Having to do with the pelvis, the lower part of the abdomen, located between the hip bones.

Peripheral stem cell support (per-IF-er-ul): A method of replacing blood-forming cells destroyed by cancer treatment. Certain cells (stem cells) in the blood that are similar to those in bone marrow are removed from the patient's blood before treatment. The cells are given back to the patient after treatment.

Progesterone (pro-JES-ter-own): A female hormone.

Prognosis (prog-NO-sis): The probable outcome or course of a disease; the chance of recovery.

Radiation therapy (ray-dee-AY-shun): Treatment with high-energy rays to kill or damage cancer cells. External radiation therapy is the use of a machine to aim high-energy rays at the cancer. Internal radiation therapy is the placement of radioactive material inside the body as close as possible to the cancer.

Radioactive (RAY-dee-o-AK-tiv): Giving off radiation.

Radionuclide scanning: An exam that produces pictures (scans) of internal parts of the body. The patient is given an injection or swallows a small amount of radioactive material. A machine called a scanner then measures the radioactivity in certain organs.



Remission: Disappearance of the signs and symptoms of cancer. When this happens, the disease is said to be "in remission." Remission can be temporary or permanent.

Risk factor: Something that increases a person's chance of developing a disease.

Screening: Checking for disease when there are no symptoms.

Side effects: Problems that occur when treatment affects healthy cells. Common side effects of cancer treatment are fatigue, nausea, vomiting, decreased blood cell counts, hair loss, and mouth sores.

Sigmoidoscopy (sig-moy-DOS-ko-pee): A procedure in which the doctor looks inside the rectum and the lower part of the colon (sigmoid colon) through a lighted tube. The doctor may collect samples of tissue or cells for closer examination. Also called proctosigmoidoscopy.

Sperm banking: Freezing sperm before cancer treatment for use in the future. This procedure can allow men to father children after loss of fertility.

Stage: The extent of a cancer, especially whether the disease has spread from the original site to other parts of the body.

Stool: The waste matter discharged in a bowel movement; feces.

Surgery: An operation.

Systemic treatment (sis-TEM-ik): Treatment that reaches cells all over the body by traveling through the bloodstream.



Tissue (TISH-oo): A group or layer of cells that together perform a specific function.

Toxins: Poisons produced by certain animals, plants, or bacteria.

Tumor: A mass of excess tissue.

Tumor markers: Substances found in abnormal amounts in the blood, in other body fluids, or in tumor tissue of some patients with certain types of cancer.

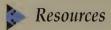
Ultrasonography (ul-tra-son-OG-ra-fee): An exam in which sound waves are bounced off tissues and the echoes are converted into a picture (sonogram).

Ultraviolet radiation (ul-tra-VI-o-let ray-dee-AY-shun): Invisible rays that are part of the energy that comes from the sun. Ultraviolet radiation can burn the skin and cause skin cancer. It is made up of two types of rays, UVA and UVB. Skin specialists recommend that people use sunscreens that block both kinds of radiation.

White blood cells: Cells that help the body fight infection and disease.

X-rays: High-energy radiation used in low doses to diagnose disease or injury, and in high doses to treat cancer.





Information about cancer is available from many sources, including the ones listed below. You may wish to check for additional information in your community and from support groups in your community.

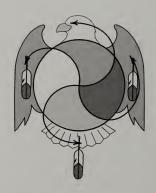
Cancer Information Service

The Cancer Information Service, a program of the National Cancer Institute, is a free, nation-wide telephone service for cancer patients and their families and friends, the public, and health care professionals. The staff can answer questions in English or Spanish and can send free printed materials on cancer prevention, early detection and self-exams, specific types of cancer, cancer treatment, and living with cancer. They also know about local resources and services. One toll-free number, 1-800-4-CANCER (1-800-422-6237).

American Cancer Society

The American Cancer Society is a voluntary organization with a national office and local units all over the country. To obtain information about services and activities in local areas, call the Society's toll-free number, 1-800-ACS-2345 (1-800-227-2345).





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